Editorial

Dexmedetomidine and delirium in the ICU

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Delirium is a common problem encountered in the care of critically ill patients. It is characterized by an acute onset of impaired cognitive functioning that has a fluctuating course with impairment in a patient's ability to process information (1). There are many proposed pathophysiologic mechanisms for delirium including decreased cholinergic activity, increased dopaminergic activity and changes in serotonergic activity (2). ICU patients seem to be at high risk of developing delirium. There are many risk factors for the development of delirium that commonly occur in ICU patients including fever, sepsis, pressor requirements and the use of medications such as benzodiazepines, opiates and anticholinergics (2). Mechanically ventilated patients appear to be at especially high risk for developing delirium during their stay in the ICU (1). There is strong evidence that in mechanically ventilated patient's delirium is an independent predictor of mortality and prolonged hospitalization (3). Delirium during ICU admission has been shown to have significant long-term impact on cognitive functioning after ICU discharge (4). Additionally, there appears to be a correlation between the duration of delirium and cognitive dysfunction after ICU discharge (4). Nonpharmacological interventions, such as physical and occupational therapy and control of noise pollution decrease delirium duration and are widely recommended (2). Haloperidol is the traditional agent for the pharmacological treatment of delirium; second-generation antipsychotics have been used as an alternative treatment (2). However, the studies evaluating these agents are generally limited by small sample size. A recent randomized controlled trial in 142 critically ill patients requiring mechanical ventilation demonstrated that haloperidol did not modify the incidence or duration of delirium (5). Given the significant burden of delirium in the ICU, new strategies to both prevent and treat delirium in the ICU are needed to address this complication and improve long-term outcomes in ICU patients.

Dexmedetomidine is a selective alpha2-adrenoceptor agonist that has sedative, analgesic, and opioid-sparing effects (6). It has an acceptable tolerability profile with the most commonly reported adverse reactions of hypotension, hypertension and bradycardia (6). Due to these side effects, caution is recommended in using dexmedetomidine in the elderly, patients with underlying heart disease and patients who experience bradycardia while on the medication (2). Generally, patients receiving dexmedetomidine are able to cooperate with nursing as they are easily awakened. The drug does not cause clinically significant respiratory depression, which has made dexmedetomidine an attractive option for sedation in the ICU (6). Dexmedetomidine has been shown to be as effective as propofol or midazolam for light sedation during prolonged mechanical ventilation with possible advantages of shorter time to extubation and a possible decrease in delirium when compared with propofol (7). In comparison with lorazepam, dexmedetomidine has been shown to have a decreased risk of delirium in mechanically ventilated ICU patients (8). Additionally, a small open label randomized trial comparing haloperidol with dexmedetomidine in patients with agitated delirium showed a significantly decreased length of ICU stay in those patients treated with dexmedetomidine (9). These studies have led to an increase in the use of dexmedetomidine for sedation in the ICU, although little data exists on the use of dexmedetomidine for the treatment of delirium.

The recent *JAMA* article by Reade *et al*. adds to the growing body of literature that suggests a beneficial effect of dexmedetomidine on delirium in ICU patients (10). In this study, patients on mechanical ventilation

with agitated delirium were randomized to receive dexmedetomidine or placebo in addition to standard medical care for the treatment of agitated delirium. Patients in the dexmedetomidine group had a significant increase in number of ventilator-free hours at 7 days and shorter duration of delirium when compared with placebo (10). This trial suggests a role for dexmedetomidine in the treatment of delirium in mechanically ventilated ICU patients. However, it is worth noting that patients in the dexmedetomidine group received significantly reduced amounts of propofol, midazolam and opioids. Dexmedetomidine's effect on delirium observed in this trial may therefore be partly due to a decrease in the use of other "deliriogenic" medications. Nevertheless, it would appear that dexmedetomidine presents an attractive alternative as a sedative agent for patients in the ICU. Furthermore, dexmedetomidine may decrease the risk of delirium and serve as a potential treatment for delirium. Dexmedetomidine is not a respiratory depressant and may be used safely in patients not receiving mechanical ventilation.

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Footnote

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